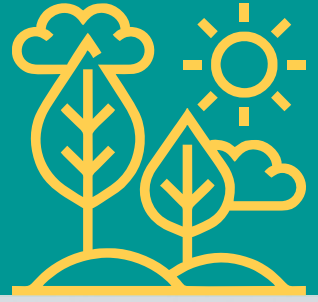


# Development of a Local Biodiversity Strategy and Action Plan (LBSAP) to Mainstream Biodiversity Conservation



Nagpur City, India

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# Development of a Local Biodiversity Strategy and Action Plan to Mainstream Biodiversity Conservation

## Nagpur City, India

### Introduction

#### Project Objectives

Accelerating climate action through the promotion of Urban Low Emission Development Strategies (Urban LEDS II) project supported the development of a Local Biodiversity Strategy and Action Plan (LBSAP) in Nagpur in the Indian state of Maharashtra. The LBSAP will provide strategic guidance and support effective management of the city's biodiversity and ecosystem services.

The objectives of the project included the following:

- Conform to the mandatory requirement of developing a LBSAP as a key instrument to attain the targets committed under the Convention on Biological Diversity (CBD) by India.
- Achieve optimal and realistic governance and management of biodiversity and ecosystem services. This will lay down the framework for sustainable and inclusive development in Nagpur.
- To ensure sustainable urban development; it is essential that the city strives to integrate the core principles of the LBSAP into broader city plans.

**Geographical area:** 227 sq. km, 10 zones, 38 *prabhags* (\*Subdivisions), 138 wards

**Population size:** 2,405,665 (Census of India, 2011)

**Population density:** 10,873 persons/sq. km

**Species diversity** (*no. of species*): ~ 253 Birds, ~ 50 Fishes, ~ 17 Reptiles, ~ 36 Mammals, and ~ 200 Trees

**Climate:** Semi-arid to dry weather; peak temperatures in May (maximum 48°C); mean annual rainfall of 1161 mm; Köppen-Geiger climate classification: "Aw" (Tropical Savanna Climate)

*Source: Nagpur LBSAP Document, October 2021*

#### Rationale of Interventions

Nagpur is the third largest city in the state of Maharashtra. It is known as the Tiger Capital of India, owing to several Tiger reserves being located in its vicinity. Nagpur is an important administrative centre and is witnessing rapid development, with the creation of large infrastructure such as a Metro Rail and Information & Technology parks. Despite being one of the greenest cities in India, Nagpur is facing the challenge of rapid urbanization. Solid waste, sewage and industrial effluents, land diversion towards industrial and commercial activities have degraded areas such as Gorewada, Futala, and Ambazari. The city's rapid development has also taken a toll on the local environment and biodiversity resulting in loss of tree cover, increased heat island effect from concretization, and reduced natural percolation of water to the ground. Thereby, there was a need to integrate aspects of biodiversity conservation and promotion in city's governance and planning

### Summary

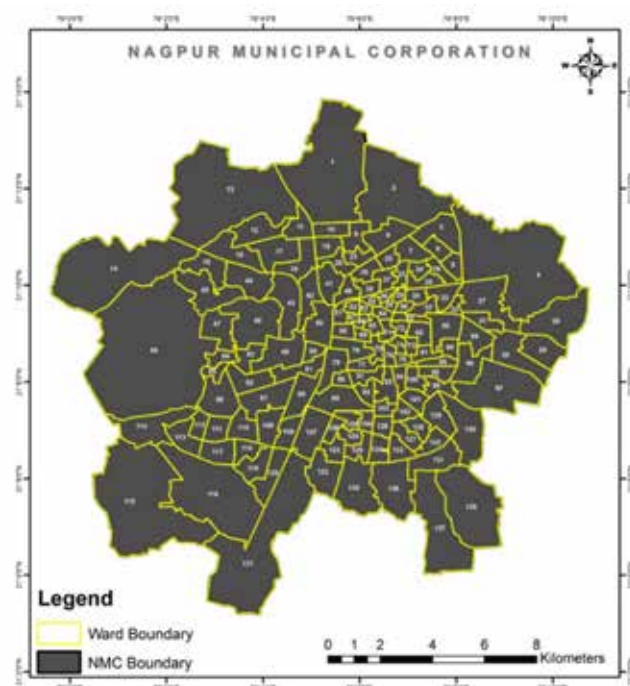
#### Snapshot of the Case Study

Nagpur city has identified planning and enhancement of biodiversity and green cover as a key action in its low emission development strategy. The Nagpur Municipal Corporation (NMC) and the Nagpur Smart and Sustainable City Development Corporation Limited (NSSCDCL), undertook various actions to document the city's biodiversity and to develop a Local Biodiversity Strategy and Action Plan. Experts from ICLEI South Asia and WWF India supported NMC and NSSCDCL in the endeavour, through the Urban-LEDS II project. As part of the project, a tree inventory was developed for select areas along with mapping them on a GIS platform (over 13,911 trees belonging to 191 (110 local and 81 exotic) species identified and documented), labelling of the identified tree species, development of a pictorial handbook to capture common tree species, documentation (primary and secondary) of the local biodiversity and ecosystems, preparation of a Natural Asset Map, and finally formulation of a comprehensive LBSAP for the city.

process. The LBSAP integrated and convergent with the Nagpur City Development Plan and Smart City Plan (as well as other plans) was deemed important for the sustainable growth of the city.

#### Organisations, Stakeholders, Location, plan implementation period

The LBSAP was developed for the city of Nagpur during 2020-2021. NMC & NSSCDCL were the primary stakeholder. The Urban-LEDS II project was implemented by NMC with support from ICLEI South Asia and



UN-Habitat. ICLEI SA managed and steered the activities with respect to providing technical assistance through Urban-LEDS II project. WWF India was engaged as expert/consultant. The LBSAP was developed with a time horizon of five years. The key stakeholders involved in or influenced by the project are listed below.

Level	Actors	Responsibilities
National	<b>Government of India</b> - environment, finance and planning departments, parliament (and/parliamentary committees)	Mainstream biodiversity into key sectors; facilitative and advisory functions on conservation, sustainable use, and facilitative and regulatory functions at the national level.
State	<b>Government of Maharashtra</b> - State Forest Department, Urban Joint Forest Management (JFM) Committees, State Urban Development Department, Maharashtra Pollution Control Board (MPCB), State Biodiversity Board	For facilitative and advisory functions on conservation, sustainable use, and facilitative and regulatory functions at the state level.
Local	Nagpur Municipal Corporation (NMC) Biodiversity Management Committee (BMC), Heritage Conservation Committee (HCC) <b>Special Purpose Vehicles (SPVs)</b> - Nagpur Improvement Trust, NSSCDCL, Nagpur Metro	NMC - Key role in governing urban biodiversity, green spaces and water bodies in the city BMC – Prepare People's Biodiversity Register (PBR) and ensure documentation, conservation, sustainable use and eco-restoration of local biodiversity. NSSCDCL - Execute and manage major environmental projects under the Smart City Mission HCC - Conserve the city's natural and built heritage.
Others	<b>NGOs and Research Institutions</b> - Panjabrao Deshmukh Krishi Vidyapeeth (PDKV) College, CSIR-NEERI, <i>Srushti Paryavaran Mandal, Ambazari Savardhan Samiti, Punarnava</i> , Green Vigil, etc. Subject Matter Experts Corporates	NGOs & others - Critical knowledge inputs in the development of the LBSAP; Local-level implementation

putting up labels on trees to display information about the tree species, and a city-level **Natural Asset Map** was prepared to capture Nagpur's natural resources. A pictorial **Handbook of Common Trees** was developed to contribute to biodiversity conservation by raising awareness and inculcating knowledge among Nagpur's citizens. It provided a meticulous description of the trees, local and common names, their uses and properties, and photographs.

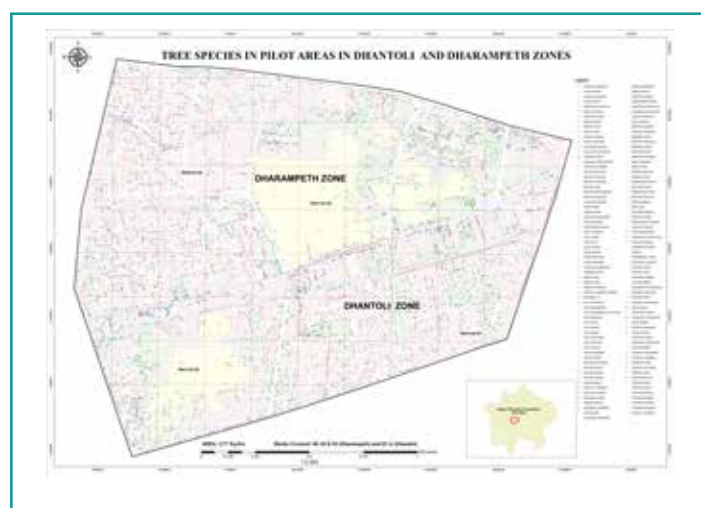
## Project Interventions

### Inputs

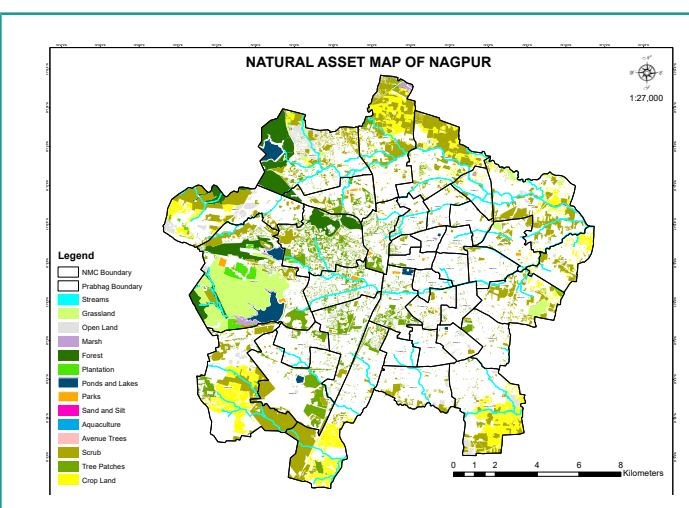
Various activities were taken up prior to developing the LBSAP. **Tree inventorization surveys** were conducted in selected areas to document and geo reference common tree species and ascertain their numbers,

### Outputs

- Detailed inventorisation of the angiosperm diversity of the selected area in the city.
- GIS based tree maps for the selected area in the city.
- Pictorial handbook of the trees of the selected area and labelling of the trees.
- LBSAP for Nagpur city.



**Figure 2:** Tree Map of Nagpur



**Figure 3:** Natural Asset Map of Nagpur



## Outcome

LBSAP will serve as a strategic guidance document for the city government and support inclusive governance and effective management of biodiversity and ecosystem services. The overarching vision of Nagpur's LBSAP was

“a prosperous, climate-resilient, smart city that promotes biodiversity conservation by generating awareness and increasing community participation, through a planned approach to build a stable and sustainable city.” The key outcomes were listed in the action plan, as tabulated below.

Focus Area 1 Protection and Promotion of Avenue Tree Plantations	Focus Area 2 Promotion and Sustainable Management of Urban Green Spaces	Focus Area 3 Promotion of Urban Agriculture, Farming Practices and Research	Focus Area 4 Protection of Rivers (Nag, Pori, Pora)	Focus Area 5 Rejuvenation and Sustainable Management of Wetlands	Reserve Forests*
<ul style="list-style-type: none"> <li>Goal 1.1 Develop new avenue plantation sites (4)</li> <li>Goal 1.2 Maintain Avenue plantations in new and existing sites (3)</li> <li>Goal 1.3 Increase habitat connectivity along rivers and between green spaces (4)</li> </ul>	<ul style="list-style-type: none"> <li>Goal 2.1 Improve and maintain green cover in city parks, gardens, and open spaces (8)</li> <li>Goal 2.2 Restore and maintain degraded urban green spaces (6)</li> <li>Goal 2.3 Maintain and monitor key biodiversity sites and biodiversity corridors (4)</li> <li>Goal 2.4 Reduce urban heat island effect (3)</li> <li>Goal 2.5 Increase rainwater harvesting (5)</li> <li>Goal 2.6 Effectively implement laws, rules and regulations for protection of urban green spaces (9)</li> </ul>	<ul style="list-style-type: none"> <li>Goal 3.1 Promote urban farming, backyard horticulture and manage stray cattle (6)</li> <li>Goal 3.2 Promote organic farming (3)</li> <li>Goal 3.3 Promote agricultural education and research (2)</li> </ul>	<ul style="list-style-type: none"> <li>Goal 4.1 Restore and rejuvenate rivers (6)</li> <li>Goal 4.2 Disaster risk reduction due to floods (4)</li> </ul>	<ul style="list-style-type: none"> <li>Goal 5.1 Purify and maintain wetlands (6)</li> <li>Goal 5.2 Rejuvenate wetland catchment area (3)</li> <li>Goal 5.3 Rejuvenate old wells which are choked, clogged or caved in (3)</li> <li>Goal 5.4 Promote livelihoods for local people (2)</li> <li>Goal 5.5 Improve solid waste disposal and management (3)</li> </ul>	<ul style="list-style-type: none"> <li>Enhance protection against anthropogenic activities (4)</li> <li>Disaster risk reduction (forest fires) (2)</li> <li>Enhance floral diversity and preserve key species habitats (3)</li> <li>Protect and maintain the Ambazari grasslands and surrounding wetlands (3)</li> </ul>

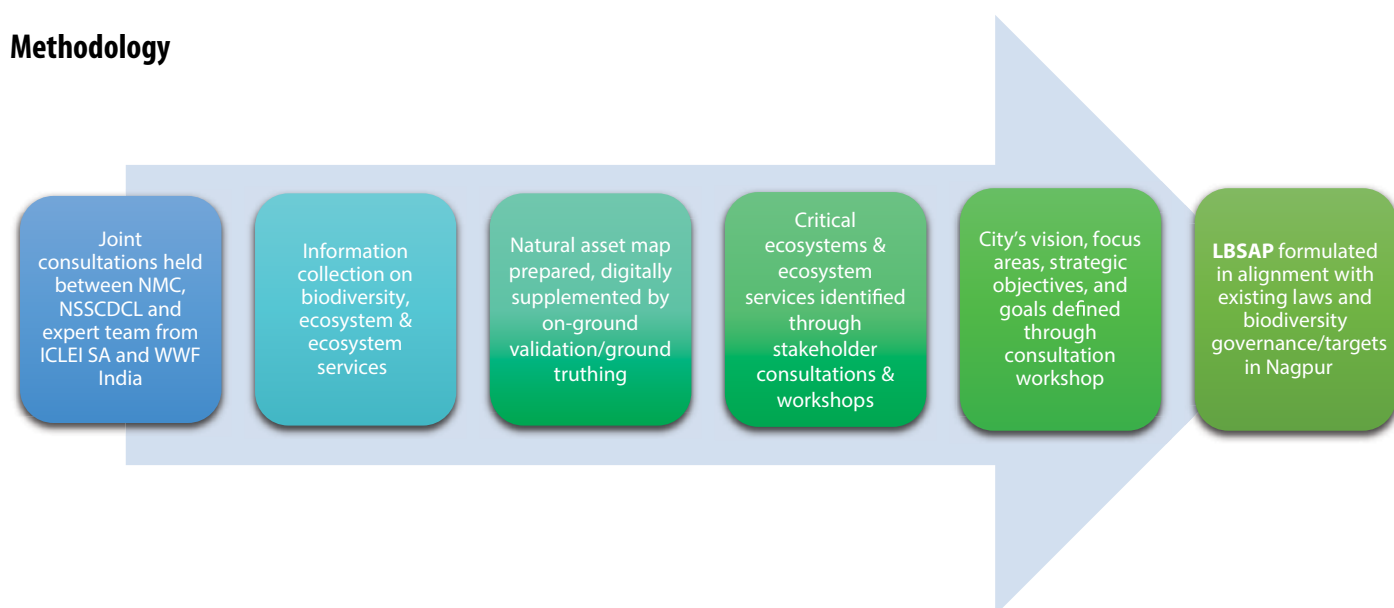
**Figure 4:** Identified Focal Areas, Goals and Actions

\* Not been identified as a Focus Area as they do not fall under NMC's jurisdiction. # The number of key action areas are within parentheses

### Pilot scale Inventorization and Labelling of Trees

As an action for biodiversity conservation, Nagpur city undertook tree inventorization in pilot area in Dhantoli and Dharampeth zones, supported through the Urban-LEDS II project. About 13,911 individual trees of 191 (110 local and 81 exotic) species were mapped in this selected area. Also, selected species were labelled using acrylic boards at identified locations such as Maharaj Baug Zoo, Dagdi Park and Lendhra Park in the pilot area. ICLEI South Asia and WWF India were supported by Punarnava (a local agency in Nagpur) in this exercise.

## Methodology



**Figure 5:** Methodology for the formulation of LBSAP Nagpur

## Understanding the opportunities

Biodiversity is an important and yet often overlooked component of the urban management and services. Almost all economic sectors have some influence on biodiversity, either directly or indirectly. Healthy ecosystems are the basis for

sustainable cities and influence most economic activities and overall well-being. Nagpur's LBSAP provides a unique opportunity and plays a critical role in enabling the city to utilize ecosystem services. It also brings in some positive changes wherein ecosystem services are considered throughout all sectors,

such as enhancing local economies, increasing resilience of climate change, enhancing quality of life, and securing livelihoods.

## Project Benefits

### Addressing Climate change and promoting urban sustainability

The critical ecosystems of Nagpur city are wetlands; rivers, reserve forests; urban agriculture; avenue/neighbourhood trees; and open green spaces. Growth in urban built-up areas over the last few decades, vehicular traffic, and infrastructure development at the cost of green cover have led to rise in temperature and heat island effect. Also, deterioration/encroachment of water bodies often aggravate the flood situation in the city after heavy rainfall events. At a time when the city faces such concerns over climate change and loss of ecosystem, it is imperative to take measures towards biodiversity conservation that can provide a sustainable environment and help manage rising temperatures in Nagpur. The development of LBSAP will certainly contribute towards environmental conservation and support climate smart development in the city.

### Socio economic elements have linkages to building climate resilience in the cities

The four categories of ecosystem services also have socio-economic elements that are connected to climate management in cities.

1. Provisioning services include food, freshwater, wood, fibre, biochemicals, genetic resources and fuel. Croplands and plantations that provide food and other important products are linked to balanced climatic conditions.
2. Regulating services are connected to climate regulation, food regulation, erosion control, disease regulation and water purification.
3. Cultural services are associated with aesthetic, spiritual, educational, recreational, cultural heritage, etc. all of which contribute to the overall wellbeing and improved quality of life.
4. Supporting services include nutrient cycling, soil formation and primary production that are in turn linked to social and economic wellbeing of the local population.

### Contributing to key ecosystem services through LBSAP goals and actions

- **Provisioning services:** Under the project, Natural Asset Map was developed for mapping the blue- green infrastructure in the city. This will help to draw attention to the products (like food) that are sourced from these ecosystems.
- **Regulating services:** Nagpur requires to build resilience towards flash floods and increasing heat island effect across the city. To this end, the LBSAP has suggested the development of an action plan for disaster risk reduction (flash floods) to identify/map flood prone areas, demarcate catchments to flood prone areas, and management of natural and engineered drainage system for flood control (Goal 4.2).

- **Cultural services:** Under the actions for restoration and rejuvenation of rivers (Nag, Pioli, Pora) in Nagpur, regulation of recreational, cultural activities, encroachment, and illegal structures has been planned (Goal 4.1). The suggested action on maintaining the aesthetic beauty of Shukrawari Talav in Nagpur city is a case in point.
- **Supporting services:** As part of the Actions developed for Reserve Forests (outside the NMC jurisdiction), protection against anthropogenic activities in Ambazari, Gorewada and Seminary Hills has been recommended.

Nagpur recognizes the importance of the city's diverse natural ecosystems & their services within urban and peri-urban areas. The city's vision and commitment towards conservation and protection of these rich ecosystems has led to the formulation of Nagpur's Local Biodiversity Strategy and Action Plan (LBSAP), prepared through the support of the Urban-LEDS II project for the inclusive and sustainable development of Nagpur city. - Dr. Pranita Umredkar, General Manager - Environment, NSSCDCL

### Linkages to Policy

The LBSAP for the city of Nagpur was aimed to support NMC and NSSCDCL in effective management of biodiversity. It also helped to contribute to 2020 Aichi Biodiversity Targets (ABTs) under the Strategic Plan for Biodiversity 2011 – 2020, United Nations Sustainable Development Goals (SDGs), 2030 Mission and 2050 Vision for Biodiversity under the Post - 2020 Global Biodiversity Framework, and National/State Biodiversity Strategy and Action Plan (N/SBSAP).

The LBSAP of Nagpur recommended the following policy actions:

- 5 Focus Areas were identified based on the critical ecosystems identified and the ecosystem services they provide. Under these five Focus Areas, 19 Goals and 84 corresponding key action areas were identified keeping in view the strategic objectives and drivers that impact them (**Figure 4**).
- An additional category on Reserve Forests (not Focus area) was identified with four goals and 12 corresponding key action areas (**Figure 4**).

India's National Biodiversity Targets	Aichi Biodiversity Targets	SDGs

Figure 6: Global Policies related to LBSAP Nagpur

- Actions and actors responsible for implementing the actions were identified for each goal.
- Actions were categorised into short, medium, or long-term ones, ranging from 6 months to 5 years.

## Challenges

### Challenges faced

There has been a general lack of integrating biodiversity concerns into developmental activities earlier in Nagpur. This has led to the degradation of biodiversity in certain areas of the city due to various challenges like solid waste, sewage and industrial effluents, land diversion for industries / commercial activities, and others.

### Addressing the challenges

Going forward, this city-led report could be integrated with other developmental plans, policies and programs like Nagpur City Development Plan and Smart City Proposal. It identified and addressed the above challenges and facilitated mainstreaming the effective management of biodiversity

into city planning that will contribute towards the sustainable and inclusive development of the city

## Lessons Learnt

With rapid urbanization, the issue of conserving biodiversity has become increasingly important. The city administration is still not adequately aware of and understand the significance of Urban Biodiversity. It is thus critical that the NMC institutionalises the developed LBSAP by integrating the actions suggested in it, with annual municipal budget. Apart from this it is crucial for the city corporation to work in collaboration with academic institutions in order to regularly monitor the status of the ecosystems and the biodiversity wealth housed in them.

The Nagpur LBSAP is a key step to support the integration of biodiversity conservation in local planning and development in order to advance the implementation of the CBD and NBSAP (National BSAP) at the city level. The city of Nagpur can play a pioneering role in showing other cities in India on how to integrate biodiversity conservation into urban planning and institutionalise the same.

## Urban-LEDS II project: A Quick Snapshot

The Accelerating climate action through the promotion of Urban Low Emission Development Strategies (Urban-LEDS II) project is a global initiative being implemented in more than 60 cities in eight countries. Urban-LEDS II supports participating local governments on low emission development to reduce greenhouse gas emissions and to simultaneously enhance resilience to adapt to climate change. The project is funded by the European Commission and implemented jointly by UN-Habitat and

ICLEI – Local Governments for Sustainability. It follows on from the first phase (Urban-LEDS I) that took place from 2012 to 2015. ICLEI South Asia is leading implementation of Urban-LEDS II in India and Bangladesh with support from UN-Habitat. The cities were being supported through pilots on climate action and planning (based on the vision, priorities, ideas, and opportunities identified by the cities). Urban-LEDS II and ICLEI South Asia are supporting these initiatives by way of technical and financial assistance.

- **Project Duration:** 2017-2021
- *Model cities in India:* Nagpur, Thane (deep-dive implementation), Rajkot (knowledge-sharing)
- *Satellite cities in India:* Coimbatore, Gwalior, Panaji, Pimpri-Chinchwad, Shimla (learning cities)
- *Model cities in Bangladesh:* Narayanganj, Rajshahi (deep-dive implementation)
- *Satellite cities in Bangladesh:* Singra, Sirajganj, Faridpur, Mongla (learning cities)

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